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AUTHOR McCroskey, James C.; And Others
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ABSTRACT

A study was conducted to determine the extent of communication apprehension among students in pharmacy schools across the United States. Fifty-one schools submitted usable completed surveys. The self-reported survey measured the level of students' shyness, and the perceived importance of interpersonal, group, and public speaking forms of communication. The results indicated that approximately one in five students in pharmacy schools was highly communication apprehensive, with some schools having as low as 4% communication apprehensive students and others as high as 30%. Approximately one-third of the 10,000 students studied indicated they were shy, but 40% of these did not consider their shyness to be a problem. Perceived importance of communication to the pharmacy profession was found to be negatively correlated with the level of communication apprehension: the more anxiety that a communication context caused, the less importance a student attached to that type of communication. (HTH)

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A STUDY OF COMMUNICATION APPREHENSION IN PHARMACY STUDENTS IN 51 COLLEGES AND UNIVERSITIES

ED231005

James C. McCroskey
Speech Communication
West Virginia University

Virginia P. Richmond
Speech Communication
West Virginia University

Bruce A. Berger
Pharmacy Care Systems
Auburn University

H. John Baldwin
Behavioral and Administrative Pharmacy
West Virginia University

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Abstract

The importance of pharmacist-patient communication to the total health care environment has received substantial attention in the pharmacy literature over the past several years. However, research has indicated that in the overwhelming proportion of transactions involving prescriptions no actual communication takes place. The present study sought to determine the extent of communication apprehension among students in 51 pharmacy schools across the United States, since the fear of communication is believed to be a major contributor to lack of communication between pharmacists as patients. The results indicate that approximately 1 in 5 students in pharmacy schools are high communication apprehensives, with some schools having as low as 4% and others as high as 30%. Approximately one-third of the 10,000 students studied indicated they were shy, but 40% of these did not consider their shyness to be a problem. Perceived importance of communication to the pharmacy profession was found to be negatively correlated with level of communication apprehension.

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A STUDY OF COMMUNICATION APPREHENSION OF PHARMACY STUDENTS IN 51 COLLEGES AND UNIVERSITIES

A communication gap exists between pharmacists and patients. Only a limited amount of pharmacist-patient communication takes place, although the need for, and desirability of, such communication consistently is stressed in professional pharmacy journals. Colleges of pharmacy have reacted to this perceived deficiency by instituting coursework in communication skills and by stressing the health care and professional benefits of communication. The first approach assumes deficient pharmacist communication skills. The second approach assumes knowledge and attitude change will lead to a behavioral change.

In 1979 Baldwin et al suggested a phenomenon known as "communication apprehension" (CA) as a possible contributing factor predisposing pharmacists to avoid patient communication (Baldwin, McCroskey & Knutson, 1979). Projecting from previous research, these authors suggested that "a pharmacist with high CA would not only be unwilling to perform a very significant portion of her or his professional role, but that even when attempts are made to fulfill that role, the probability of success is very low" (p. 91).

Four constructs internal to an individual, all of which result in the avoidance of communication, are described in communication theory: communication apprehension, reticence, unwillingness to communicate, and shyness. Unwillingness to communicate is viewed as a global predisposition, a general avoidance of communication, no matter what the reason for that avoidance, which could include communication apprehension, reticence, and/or shyness (Burgoon, 1976; Kelly, 1982). Reticence is assumed to be primarily a problem of deficient communication skills (Sokoloff & Phillips, 1976; Kelly, 1982). Communication apprehension, as conceptualized by McCroskey, is defined as "an individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons" (McCroskey, 1977). Shyness is a broader construct than either reticence or CA, spanning "a wide behavioral-emotional continuum" (Zimbardo, 1977). At one end of this continuum are shy persons who prefer solitude. "Such persons may have a personality problem or no problem at all" (Kelly, 1982). Shyness is seen as the tendency to talk and engage in communication with others less than the norm, which may result from high CA, lack of verbal skills, or other causal factors (McCroskey & Richmond, 1982). Although causal differences between the constructs are posited, distinctions are difficult to establish empirically since the constructs overlap and result in the same behavior, i.e. avoidance of communication (Kelly, 1982).

Because of the stable nature of CA, the high CA pharmacy student upon graduation is likely to conform to the traditional stereotype of the pharmacist hiding from the public in the prescription department (Dichter, 1973; Smith, 1977). This stereotype would suggest that individuals with high CA might be attracted to the pharmacy profession (Daly & McCroskey, 1975). The original data collected at West Virginia University indicated that the proportion of high communication apprehensive pharmacy students was approximately 20 percent, similar to the distribution of the trait in the general adult population. Unpublished data with subsequent classes at West Virginia and in other pharmacy schools suggested a higher rate. Later studies reported 25 percent of the pharmacy students were severely communicative apprehensive (Berger & McCroskey,

1982; Berger, Baldwin, McCroskey & Richmond, 1982). Speculation as to the reasons for this higher proportion centered on admissions policies, specifically pre-admission interviews and the declining applicant pool which has led to a higher accepted/applied ratio.

Study Objectives

This study was undertaken with three specific objectives:

1. To measure communication apprehension in pharmacy students on a national basis;
2. To determine the extent of the problem among pharmacy students; and
3. To analyze the relationship between curricular and admissions structures and the extent of communication apprehension.

METHODOLOGY

During late summer-early fall of 1981, letters were mailed to a designated faculty member at each of the 71 schools of pharmacy in the continental United States, soliciting his or her assistance in conducting the study. This letter briefly described the study, indicated it was conducted with the American Association of Colleges of Pharmacy funding, and the mode of questionnaire administration. If no response was received from the designated individual within a month, attempts were made to contact her or him by telephone.

During the fall of 1981, bulk mailings were made to 63 schools of pharmacy who had agreed to participate. Each mailing consisted of a cover letter, coordinator questionnaire, and sufficient student questionnaires for the school's enrollment.

The cover letter described the student questionnaire, gave instructions for its administration (classroom distribution, voluntary participation, assurance of anonymity, and estimated time to complete), and asked the faculty member to complete the coordinator questionnaire. The coordinator questionnaire asked questions regarding the existence of communication courses in the curriculum, types of admissions criteria employed, curricular configuration, and the number of students who applied, were accepted, and were presently enrolled in each current class.

The 63 participating schools were sent a total of 21,640 student questionnaires. The student questionnaire contained demographic items (age, sex, race, year of graduation, degree expected), the 24-item PRCA (Personal Report of Communication Apprehension; McCroskey, 1982), three items on attitude towards communication, and three questions concerning shyness.

The PRCA is the most widely used measure of CA and has been demonstrated to be highly reliable and valid (McCroskey, 1970, 1978). Although it is a self-report measure of cognition, not a measure of actual behavior, there is a high degree of association between PRCA score and communication behavior.

Shyness is also measured by self-report, with individuals dichotomized as shy or not-shy (Zimbardo, 1977). In a validation study, individuals who called themselves shy were labeled as shy be trained observers 67 percent of the time

(Pilkonis, 1977). Self-report of shyness appears to be effective and appropriate "since it does not exclude those who feel they have a problem but do not exhibit either inept behavior or physical signs of tension (Kelly, 1982)."

The present study used Zimbardo's shyness identification procedure, dichotomous measures which allowed students to be classified into four shyness levels:

Shyness level 1: Student is not shy now, and never was.
Shyness level 2: Student is not shy now, but once was.
Shyness level 3: Student is shy now, but does not consider it a problem.
Shyness level 4: Student is shy now, and considers it a problem.

Three items on the survey instrument examined the perceived importance of communication. Students were asked to rate interpersonal, group, and public speaking forms of communication as: (1) not important, (2) moderately important, and (3) very important. Students were also asked to indicate whether they had taken or were currently taking a public speaking course or oral communication course.

Completed questionnaires were returned in bulk by participating schools. Telephone follow-up was attempted with those faculty members from whom questionnaires had not been received as of January, 1982. Completed questionnaires were computer analyzed as they were received.

RESULTS AND DISCUSSION

Description of Final Sample

Sixty-three schools of pharmacy agreed to participate in the study, and were mailed a total of 21,640 student questionnaires. Of the eight schools not sent questionnaires, four could not be contacted by telephone follow-up, and four declined to participate, citing school policies or administrative constraints.

Fifty-two schools submitted 10,233 usable completed questionnaires of which 10,004 from 51 schools were analyzed (one school's 229 completed questionnaires were received in late June, after computer analysis for this report was completed). Of the other 11 schools not represented, one school declined to participate because of an administrative barrier, one set was apparently lost in the return mail, and the remainder was either not reached by telephone follow-up and/or did not follow through on the promised completion.

The latest published enrollment figures for schools of pharmacy (Speedie, 1981), for 1980, are not strictly comparable. That report indicates 24,669 students enrolled in pharmacy schools seeking their first degree in pharmacy, and 464 students possessing a B.S. in Pharmacy seeking a Pharm.D. degree. This would indicate that our final analyzed sample represents 71.8 percent of pharmacy schools and approximately 40 percent of the pharmacy student population.

This percentage is based on an overestimate of the number of potential student respondents. Typically, a large percentage of students in their final

professional year are involved in externships or clerkships, and thus not accessible for questionnaire administration through regular classroom procedures. Therefore, the large majority of these students are not represented in the final results. Since there are an estimated 7,000 pharmacy students in their final year, the adjusted response rate approaches 65 percent.

Non-Response Bias

A number of techniques are used to measure the possibility of non-response errors (Churchill, 1976; Kish, 1978; Nunnally, 1978). The most popular method is based upon demographic characteristics of respondents and non-respondents. However, current demographic data on the nation's pharmacy students simply are not available. The most current data is for 1980 (Speedie, 1981). Even over the past year, the male-female ratio has changed considerably. Therefore, demographic methods were not usable. Since the survey instrument was sent to literally every pharmacy student, not simply a random sample, one is fairly safe in assuming that, unless regions of the country are not represented, the respondents are representative of the population. The final data includes respondents from all geographical regions.

To determine if non-response error is a problem, a third methodological approach is possible. "A... way by which the adjustment is sometimes made involves keeping track of those responding to the initial contact, the first follow-up, the second follow-up, and so on. The mean of a variable (or variables, or other appropriate statistics) is then calculated, and each subgroup is compared to determine if any statistically significant differences emerge as a function of the difficulty experienced in making contact. If not, the variable mean for the respondents is assumed equal to the mean for those responding. This inferential method is particularly valuable in mail surveys, where it is an easy task to identify those responding to the first mailing. . . and so on" (Churchill, 1976).

After 5,000 responses were received, telephone follow-up to non-responding schools began. Respondents were divided into pre-follow-up and post-follow-up groups. Table 1 summarizes the statistical comparisons between the groups. No statistical differences were found. Although this approach to test for non-response error is not absolutely conclusive, it may be inferred that the characteristics of non-respondents appear to be reasonably similar to those of the respondents.

Because of the manner in which the survey instrument was administered, nonresponse was more a function of the school and coordinator than of pharmacy students. Finally, it should be reiterated that this was a population survey.

Communication Apprehension

For pharmacy students, the PRCA mean score and standard deviation was 65.15 and 16.28, respectively (N=9830). These numbers compare favorably to general population figures (N=40,000) of 65.6 and 14.1. Pharmacy students appear to be "normal" relative to the population in general in terms of communication apprehension. However, there is greater variability in the pharmacy student data.

Mean PRCA scores from the participating schools ranged from 57.24 to 69.14 (Table 2). One if five individuals (20 percent) in the general population is highly communication apprehensive (PRCA score > 79) (McCroskey, 1978). The present data indicate 19.5 percent of the pharmacy students studied would be classified as high communication apprehensives (PRCA score > 79). Although this figure appears normal, the proportion of high CA students at participating schools ranged from 4 percent to 29 percent.

Differences in PRCA scores were examined in terms of sex, race, and rural-urban background (Tables 3 through 5). Although there are statistically significant differences for all three variables, caution in interpretation of the results is necessary. It is quite easy to demonstrate statistically significant differences with such large sample sizes. The important question is: are these differences "clinically" or pragmatically useful? In regard to sex, both male and female respondent PRCA scores are certainly in the normal range even though males have slightly lower PRCA scores than females.

Analysis of variance (ANOVA) showed statistically significant differences in race/ethnic group. Blacks were the lowest apprehensives; orientals were the highest. It is likely that blacks in pharmacy schools come from middle class or upper middle class backgrounds, and are not necessarily representative or typical of black students in general. Since oriental cultures do not value "talk" as much as does American culture, it is not surprising that orientals had the highest PRCA mean score as a group. In the home, the oriental student is not encouraged to be highly verbal and vocal, yet outside the home these behaviors are valued. Communication apprehenrion may result from conflicting cultural values.

Although ANOVA demonstrated statistically significant differences in PRCA scores based on town size, the mean PRCA scores are all within two units of the general population mean. For all practical differences, there are no real differences in these scores. The statistical significance is more an artifact of the large sample size.

Communication Apprehension and Shyness

Over a third (34.4 percent) of the respondents said they were currently shy (Table 7). This compares to a general population norm of 40 percent (Zimbardo, 1977). Forty-six percent of those who considered themselves shy now said it wasn't a problem. This result is particularly disturbing since these people will not actively engage in communication with others. They seek to enter a profession which professes high value given to a patient counseling role, yet these individuals don't perceive their shyness as a problem.

Table 6 illustrates the strong relationship between shyness level and PRCA score. Those students in Shyness level 4 (currently a shy problem) have PRCA scores (on the average) that classify them as high apprehensives. Students in Shyness level 3 (currently shy, but not a problem) have CA scores that are considerably higher than general population norms.

Table 7 examines the relationship between communication apprehension and shyness in a somewhat different manner. Three levels of communication apprehension were cross-tabulated with the four shyness levels. Sixty-three percent

of the high CA students were shy. A total of 1350 students (14 percent) were both highly communication apprehensive and shy. However, 442 of these students did not consider their shyness to be a problem. This finding is especially curious since their PRCA score classifies them as individuals who are highly anxious about communicating. It is quite possible that these individuals don't consider their shyness (or CA) a problem since they simply avoid communication situations and hence the resultant anxiety.

The Spearman correlation coefficient (0.458) for the data in Table 7 indicates a strong positive relationship between shyness and communication apprehension. Since shyness may result from personal preference, anxiety and/or a skills problem, all of the variability in the data will not be explained. To reiterate, shyness and communication apprehension are two different constructs, even though the resultant behavioral manifestations (avoidance of communication situations) may be the same (Kelly, 1982).

Communication Apprehension and Perceived Importance of Communication

Tables 8-10 present the relationship between PRCA scores and perceived importance of various types of communication. A consistent observation is that those individuals who valued each type of oral communication as "very important" had the lowest mean PRCA scores. The more threatening or anxiety producing the communication situation (interpersonal is less threatening than group which is less threatening than public speaking), the lower the PRCA score for the "very important" category. With the exception of one category of interpersonal communication, the lower the importance assigned, the higher the PRCA scores. The interpretation is that the higher the amount of anxiety produced by a communication context for an individual, the less that type of communication will be valued. Both high apprehensives and shy people will value all communication situations less than low apprehensives because of that anxiety. The result makes it easier to understand why over 40 percent of those who consider themselves shy don't consider it a problem. Psychologically, their values and behavior are congruent. Since they don't heavily value communication in various contexts, they don't engage in those contexts (or vice versa). Therefore, their shyness does not present a problem for them.

Communication Apprehension, Communication Courses, Curricular Structure, and Admissions Procedures

Table 11 relates communication apprehension to communication coursework. Students who had taken or were currently taking communication courses (oral or public speaking) had significantly lower communication apprehension levels than those who had not. Either these courses lowered the student's CA level or students with higher CA levels don't seek out these courses. The latter explanation seems more plausible.

Table 12 examines the relationship between dominant program arrangement and communication apprehension. The degree of communication apprehension was not related to program configuration, although Pharm.D. program students had lower than average PRCA scores. Also, the self-reported Pharm.D. degree seeking students had lower than average PRCA scores (Table 13). This was especially true of students seeking post-graduate Pharm.D. degrees. It is reasonable

to assume that students entering B.S. degree programs in pharmacy view the profession much as does the lay public. Indeed, some students may be initially attracted to pharmacy because of a perceived lack of communication. Students pursuing a post-graduate Pharm.D. program could be expected to be more knowledgeable about curriculum components and practice expectations involving communication such as patient counseling, in-service education, hospital rounds with physicians, etc. It is logical that these communication expectations might screen out high CA people and that consequently only those students who had lower levels of anxiety about communicating would be attracted to the post-graduate Pharm.D.

The coordinator questionnaire sought information on the degree to which various factors were weighted in the admissions decision. Unfortunately, few coordinators were able to supply such information in a quantitative form. For purposes of this research, therefore, to gain some insight into the question of whether or not high CA students were attracted to the pharmacy profession, the admissions criteria were analyzed as either "interview" or "no interview". Even this dichotomy is not methodologically precise since when interviews are conducted as part of pre-admissions screening, they take several forms, and may have several purposes: group interviewers, interview by school official, interview "if necessary", "of marginal applicants", etc. Table 14 summarizes the mean PRCA scores and ratio of students accepted to number of applicants for schools with interview and schools with no interview. Generalities about the accepted/applied ratio are difficult to make.

There are differences in PRCA means between interview and no-interview schools for the graduating classes of 1984 and 1985, but no differences between the graduating classes of 1982 and 1983. It appears plausible that pre-admission interviews screen out very high CA students either through the interview itself, or by discouraging these would-be applicants. As students progress through school, the interview effect is lost, most likely through either voluntary and involuntary attrition, as the needed communication aspects of practicing pharmacy are stressed in the curriculum.

CONCLUSIONS

Approximately 1 in 5 pharmacy students (similar to the general population) has high communication apprehension. There is wide variability within and between schools. The proportion of high CA individuals in different schools ranged from 4 percent to nearly 30 percent. These people are likely to become high CA pharmacists who will not actively engage in communication with patients or may be ineffective if they do so.

In addition, over one-third of pharmacy students consider themselves shy. The proportion varies from 25 percent to 42 percent at different schools. Approximately 40 percent of these shy individuals don't consider their shyness a problem even though many of them are highly communication apprehensive. These shy individuals are also likely to avoid communication situations much of the time.

The more anxiety a communication context causes, the less importance a student attaches to that type of communication. It appears an attempt is being

made to make the importance of oral communication consistent with the person's cognitions; in effect, to rationalize the avoidance of communication.

Interviews as a part of the admissions process may be partially successful in screening out the extremely high CA applicants, but further investigation is necessary on this aspect.

At least one out of five pharmacy students, and possibly as high as one in three, will avoid communication as far as possible.

References

Baldwin, H. J., McCroskey, J. C. & Knutson, T. J. Communication apprehension in the pharmacy student. American Journal of Pharmaceutical Education, 1979, 43, 91-93.

Berger, B. A., Baldwin, H. J., McCroskey, J. C. & Richmond, V. P. The use of systematic desensitization and classroom instruction to reduce communication apprehension in pharmacy students. American Journal of Pharmaceutical Education, 1982, 46, 227-234.

Berger, B. A. & McCroskey, J. C. Reducing Communication in Pharmacy Students. American Journal of Pharmaceutical Education, 1982, 46, 132-136.

Burgoon, J. The unwillingness-to-communicate scale: Development and validation. Communication Monographs, 1976, 43, 60-69.

Churchill, G. A. Marketing research methodological foundations, Hinsdale, IL: Dryden Press, 1976.

Daly, J. A. & McCroskey, J. C. Occupational choice and desirability as a function of communication apprehension. Journal of Counseling Psychology, 1975, 22, 309-313.

Kelly, L. A rose by any other name is still a rose: An examination of four conceptualizations of a communication problem. Human Communication Research, 1982, 8, 99-113.

Kish, L. Survey sampling, New York: Wiley and Sons, 1978.

McCroskey, J. C. Measures of communication-bound anxiety. Speech Monographs, 1970, 37, 269-277.

McCroskey, J. C. Oral communication apprehension: A summary of recent theory and research. Human Communication Research, 1977, 4, 78-96.

McCroskey, J. C. Validity of the PRCA as an index of oral communication apprehension. Communication Monographs, 1978, 45, 192-203.

McCroskey, J. C. An introduction to rhetorical communication, 4th ed., Englewood Cliffs, NJ: Prentice Hall, 1982.

McCroskey, J. C. & Richmond, V. P. Communication Apprehension and Shyness: Conceptual and Operational Distinctions. Central States Speech Journal, 1982, 33, 458-468.

Nunnally, T. C. Psychometric Theory, New York: McGraw-Hill, 1978.

Pilkonis, P. A. Shyness, public and private, and its relationship to other measures of social behavior. Journal of Personality, 1977, 45, 585-595 (a).

Speedie, S. M. Enrollment report on professional degree programs in pharmacy, fall, 1980. American Journal of Pharmaceutical Education, 1981, 45, 399-429.

Smith, D. L. Communication its role in the curriculum. Canadian Pharmacy Journal, 1977, 11, 336-341.

Sokoloff, K. A. & Phillips, G. M. A refinement of the concept "reticence". Journal of Communication Disorders, 1976, 9, 331-347.

The Dichter Institute for Motivational Research, Inc., Communicating the value of comprehensive pharmaceutical services to the consumer, American Pharmaceutical Association, Washington, D.C., 1973, pg. 14.

Zimbardo, P. G. Shyness. Reading, Mass.: Addison-Wesley, 1977.

Table 1. Several Characteristics of Respondents Over Time

Approximate N	PRCA Score Mean	PRCA Score Std. Dev.	Sex[a]	Mean Age	Shy[b]
5,000	65.37	16.08	1.51	22.29	1.66
8,500	65.06	16.24	1.50	22.31	1.66
10,000	65.15	16.29	1.50	22.29	1.66

[a] 1 = Male; 2 = Female

[b] 1 = Yes; 2 = No

Table 2. Summary Data on Communication Apprehension and Shyness by School

School	Mean PRCA Score	Proportion of of High CA Students	Proportion of Shy Students	Proportion of Students in Shy Level 4
1	64.70	20.53	39.33	17.45
2	67.49	21.21	39.90	19.29
3	66.46	22.39	32.83	15.56
4	64.45	19.27	32.81	17.62
5	66.87	24.09	38.35	21.81
6	66.55	22.84	35.43	17.60
7	62.63	10.98	29.66	12.43
8	64.34	15.32	36.80	18.40
9	65.52	18.85	38.50	16.38
10	64.46	18.87	34.11	16.90
11	64.76	18.92	28.34	13.90
12	63.44	19.26	32.09	15.04
13	63.02	15.47	29.44	17.22
14	64.02	16.67	27.71	24.39
15	57.24	4.08	36.00	20.41
16	63.37	13.30	31.75	11.23
17	67.47	24.52	31.51	18.41
18	67.20	20.39	40.29	20.69
19	65.17	18.58	35.97	11.79
20	67.51	21.31	36.07	21.31
21	66.90	20.92	38.31	21.57
22	66.31	22.22	41.73	21.77
23	66.92	21.13	34.25	17.24
24	64.50	14.60	36.03	14.40
25	63.29	15.58	28.19	16.44
26	68.64	28.15	41.85	22.18
27	65.48	19.70	32.09	15.04
28	63.92	14.94	31.21	18.13
29	66.96	22.49	36.17	17.74
30	61.94	13.37	29.90	18.72
31	64.54	14.82	41.46	13.75
32	62.30	14.40	30.20	13.83
33	65.62	18.37	33.00	18.00
34	67.04	25.83	38.81	22.26
35	63.87	20.57	30.93	18.28
36	66.52	22.36	36.67	17.80
37	63.68	15.95	31.52	18.90
38	61.29	12.35	32.86	18.11
39	62.35	20.43	40.24	22.22
40	64.41	17.47	28.76	19.11
41	65.61	13.33	33.89	22.47
42	69.10	28.91	37.84	24.83
43	63.52	20.00	38.10	23.33
44	64.95	18.75	26.98	12.90
45	69.14	25.35	38.03	21.13
46	69.01	27.50	36.98	15.13
47	67.88	26.04	43.62	25.53
48	63.88	17.53	35.14	21.32
49	65.08	21.21	36.03	19.40
50	66.23	20.32	33.98	22.62
51	67.80	23.53	39.22	16.33
Total Sample	65.15	19.59	34.4	18.31

Table 3. PRCA Scores of Male and Female Respondents

Sex	N	PRCA Score	Student t	Statistical Significance
Male	4894	63.90	7.70	$p < 0.0001$
Female	4710	66.42		

Table 4. Race/Ethnic Group PRCA Scores of Respondents

Race/ Ethnic Group	N	PRCA Score	F Value	Statistical Significance
White	8437	65.02		
Black	393	59.87		
Oriental	467	71.18	28.13	$p < 0.0001$
Native American	53	67.32		
Hispanic	189	67.62		

Table 5. Town Size of Respondents and PRCA Scores

Town Size	N	PRCA Score	F Value	Statistical Significance
Farm	642	67.28		
Under 5,000	1725	65.66	6.88	$p < 0.0002$
5,000-50,000	3631	65.42		
Large City or Suburb	3600	64.43		

Table 6. Shyness Level and Mean PRCA Scores

Shyness Level	N	PRCA Score	F Value	Statistical Significance
1	1879	55.45		
2	4436	60.92	1230.60	$p < 0.0001$
3	1516	72.24		
4	1756	79.81		

Table 7. Communication Apprehension Level and Shyness Level

Frequency Percent Row Percent Column Percent	1	2	3	4	TOTAL
1 PRCA<52	739 7.71 38.25 39.33	1075 11.21 55.64 24.23	83 0.87 4.30 5.47	35 0.37 1.81 1.99	1932 20.15
2 PRCA>51 & PRCA<80	1046 10.91 18.05 55.67	2944 30.70 50.79 66.37	993 10.36 17.13 65.42	813 8.48 14.03 46.30	5796 60.44
3 PRCA>79	94 0.98 5.05 5.00	417 4.35 22.41 9.40	442 4.61 23.75 29.12	908 9.47 48.79 51.71	1861 19.41
TOTAL	1879 19.60	4436 46.26	1518 15.83	1756 18.31	9589a 100.00

[a]adjusted for missing data

Spearman Correlation = 0.458

Table 8. Importance of Interpersonal Communication and Communication Apprehension

Importance	N	Mean PRCA Score	F Value	Statistical Significance
Not Important	152	67.58		
Moderately Important	715	69.09	25.45	$p < 0.0001$
Very Important	8742	64.74		

Table 9. Importance of Group Communication and Communication Apprehension

Importance	N	Mean PRCA Score	F Value	Statistical Significance
Not Important	544	73.81		
Moderately Important	5667	67.18	291.70	$p < 0.0001$
Very Important	3387	60.22		

Table 10. Importance of Public Speaking and Communication Apprehension

Importance	N	Mean PRCA Score	F Value	Statistical Significance
Not Important	2043	71.54		
Moderately Important	5277	65.10	322.94	$p < 0.0001$
Very Important	2275	59.31		

Table 11. Communication Courses and Communication Apprehension

Course	N	Mean PRCA Score	Student t	Statistical Significance
Public Speaking				
Yes	3236	62.08	13.22	$p < 0.0001$
No	6587	66.66		
Oral Communication				
Yes	3017	62.66	10.12	$p < 0.0001$
No	6803	66.25		

Table 12. Program Arrangement and Communication Apprehension

Program	N	Mean PRCA Score	F Value	Statistical Significance
1-4; B.S. degree	2058	65.19		
0-5; B.S. degree	1243	65.30	2.14	p = 0.092
2-3; B.S. degree	4951	65.39		
Pharm.D. (first degree)	551	63.55		

Table 13. Anticipated Degree and Communication Apprehension

Degree	N	Mean PRCA	F Value	Statistical Significance
B.S. Pharmacy	8723	65.29		
Pharm.D.	643	63.80	4.90	p = 0.0023
Pharm.D.(Post Grad)	132	61.12		

Table 14. Comparison of PRCA Scores with Admission Interview Policy

	INTERVIEW			NO INTERVIEW		
	N	Ratio Accepted/Applied	PRCA Score	N	Ratio Accepted/Applied	PRCA Score
1982	861	0.52	65.73	763	0.61	64.13
1983	970	0.61	65.26	906	0.64	66.72
1984	1223	0.64	63.98	1186	0.67	65.36
1985	357	0.52	64.99	252	0.66	68.80